Digital fabrication and wellbeing: human agency in post-automation

An analysis into the appropriation of digital design and fabrication technologies by crafters and coders in non-industrial settings

Cian O'Donovan *@cian* Adrian Smith *@smithadrianpaul* Ed Steinmueller
4S, Boston, August 2017

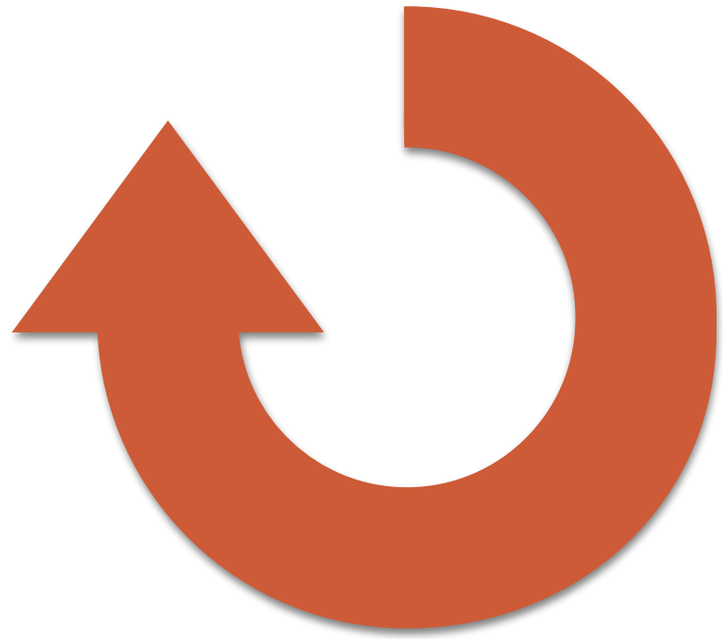
Project Responsible innovation and happiness: A new approach to the effects of ICTs
Funder The Research Council of Norway **Coordination** TIK Centre, University of Oslo

UNIVERSITY OF SUSSEX | SPRU SCIENCE POLICY RESEARCH UNIT

Craft is coming full circle

Design is no longer a one-way system of control

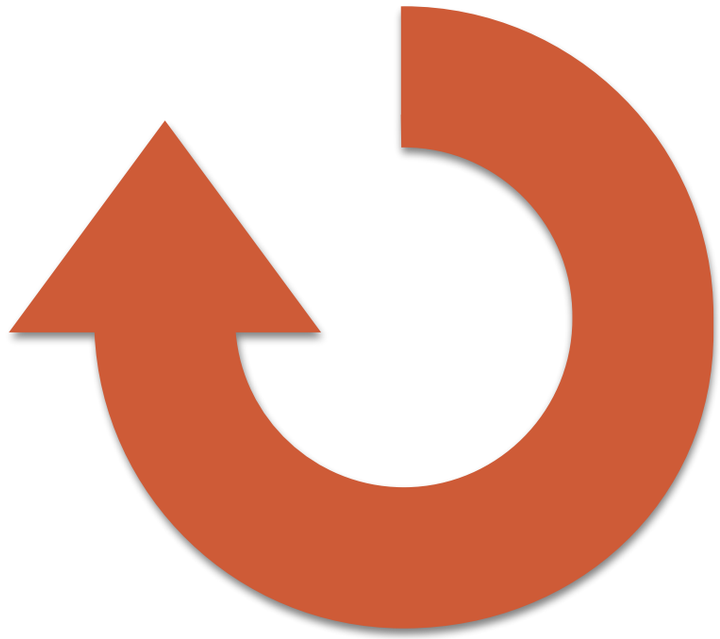
– Cardoso (2010)



=> new craft relations and sensibilities between designers, producers, consumers and things

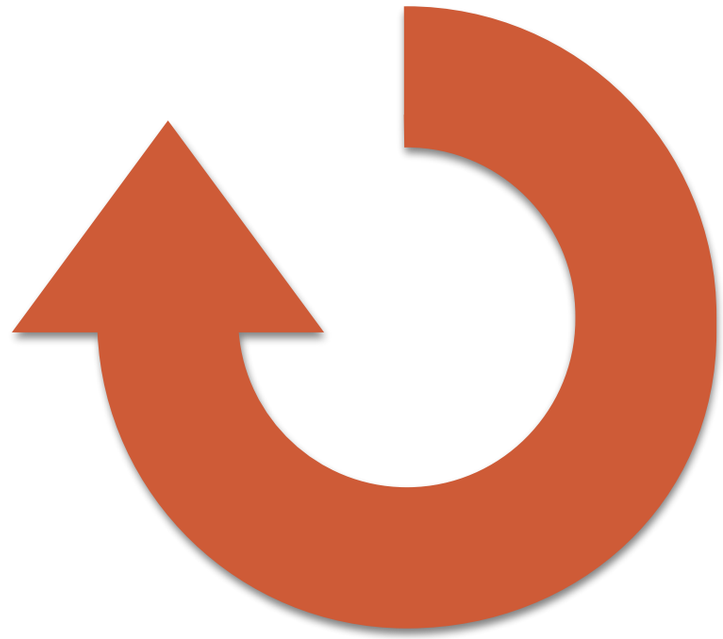
Through widening appropriation of tools such as CAD/CAM, 3D printers, laser cutters and routers

Post-automation contexts



Post-automation contexts

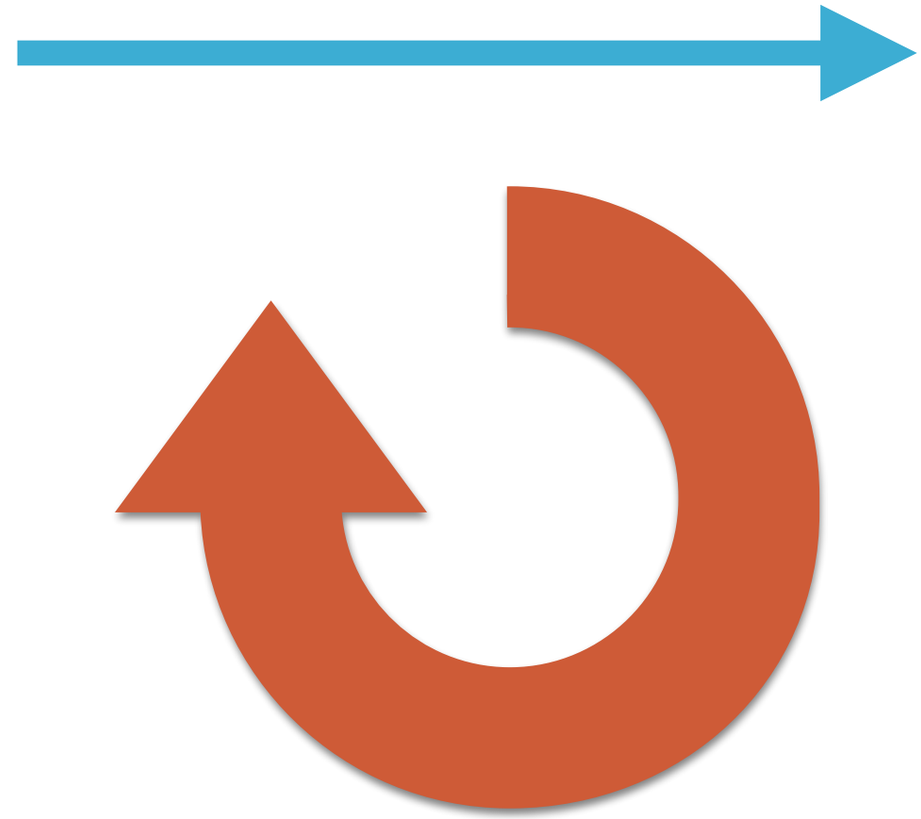
If craft is coming full circle, it's doing so in the context of *post-automation:*



Post-automation contexts

If craft is coming full circle, it's doing so in the context of *post-automation:*

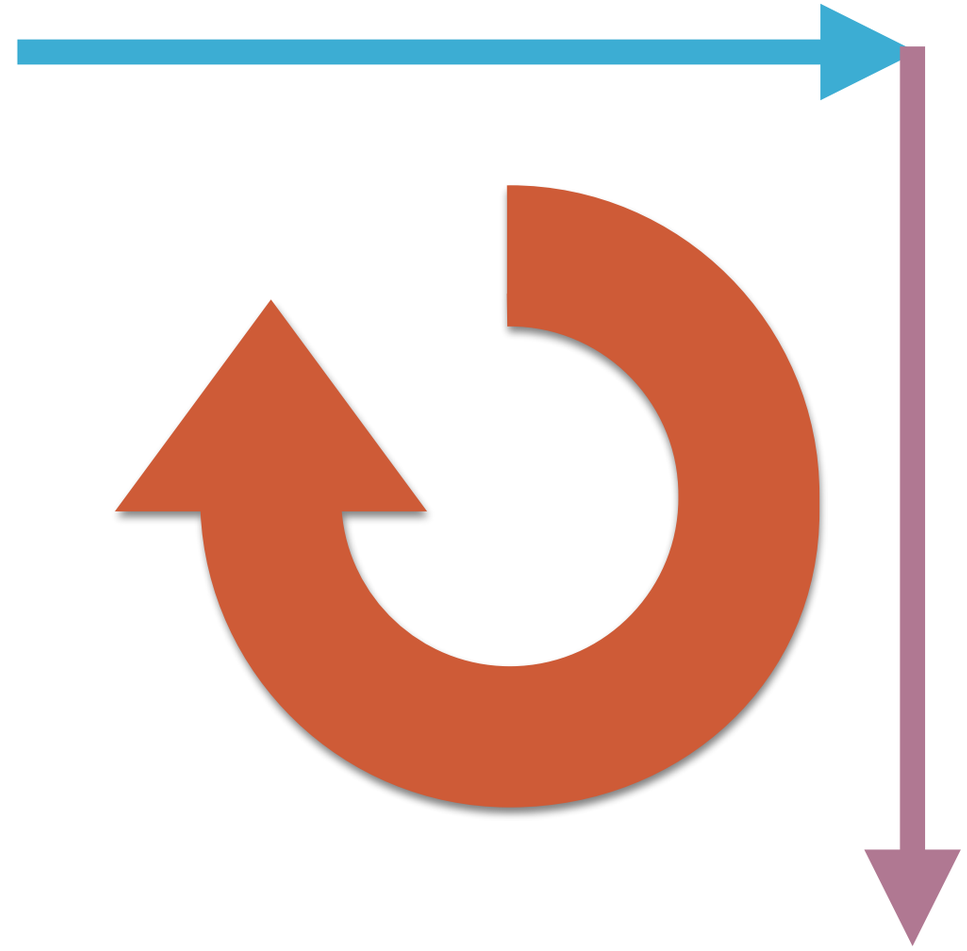
- reappraising human agency in 'automation' technologies



Post-automation contexts

If craft is coming full circle, it's doing so in the context of *post-automation:*

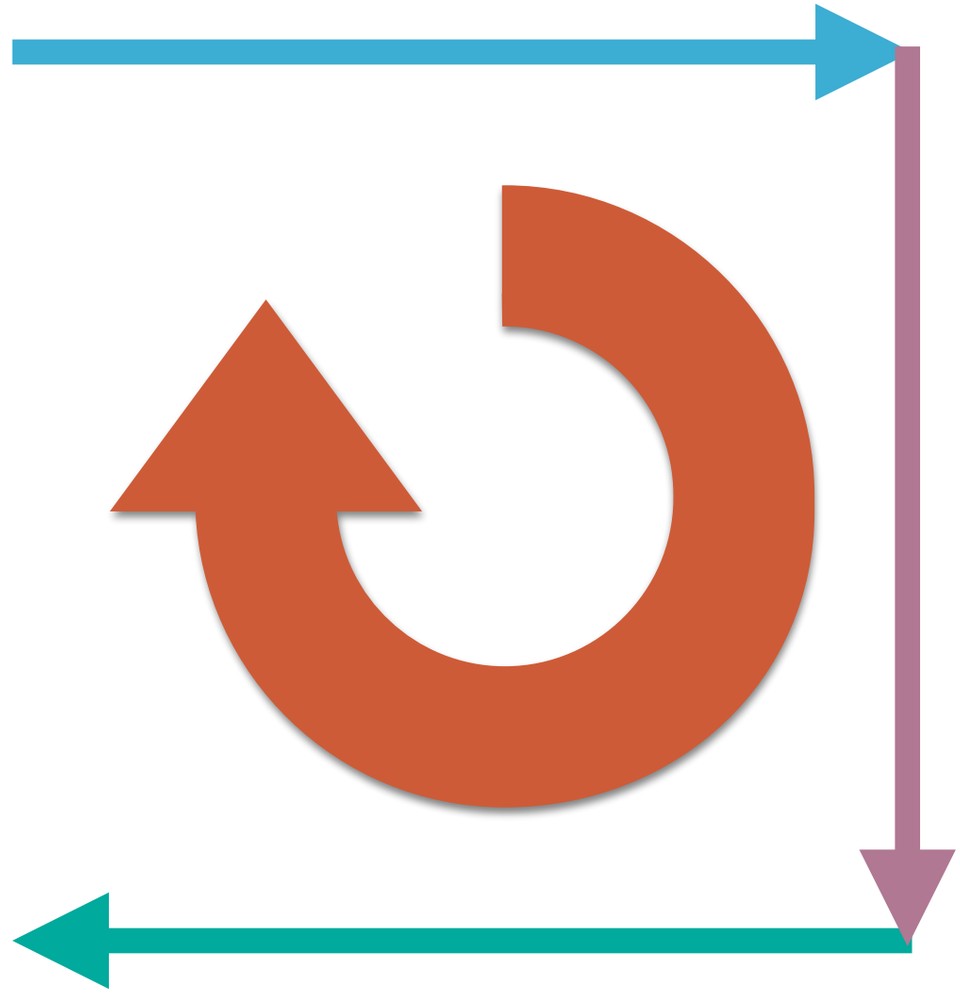
- reappraising human agency in 'automation' technologies
- into non-industrial and new-industrial spaces



Post-automation contexts

If craft is coming full circle, it's doing so in the context of *post-automation:*

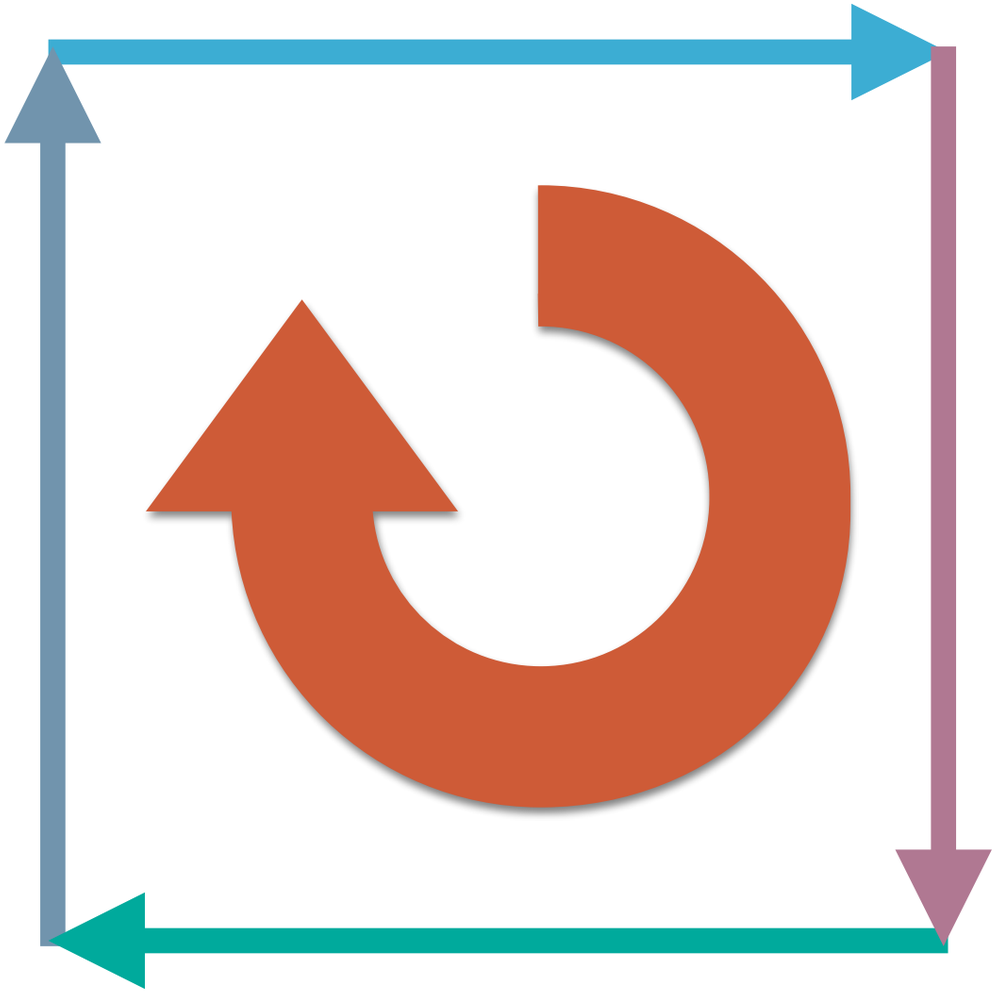
- reappraising human agency in 'automation' technologies
- into non-industrial and new-industrial spaces
- groups are pursuing creative livelihoods and environmental sustainability



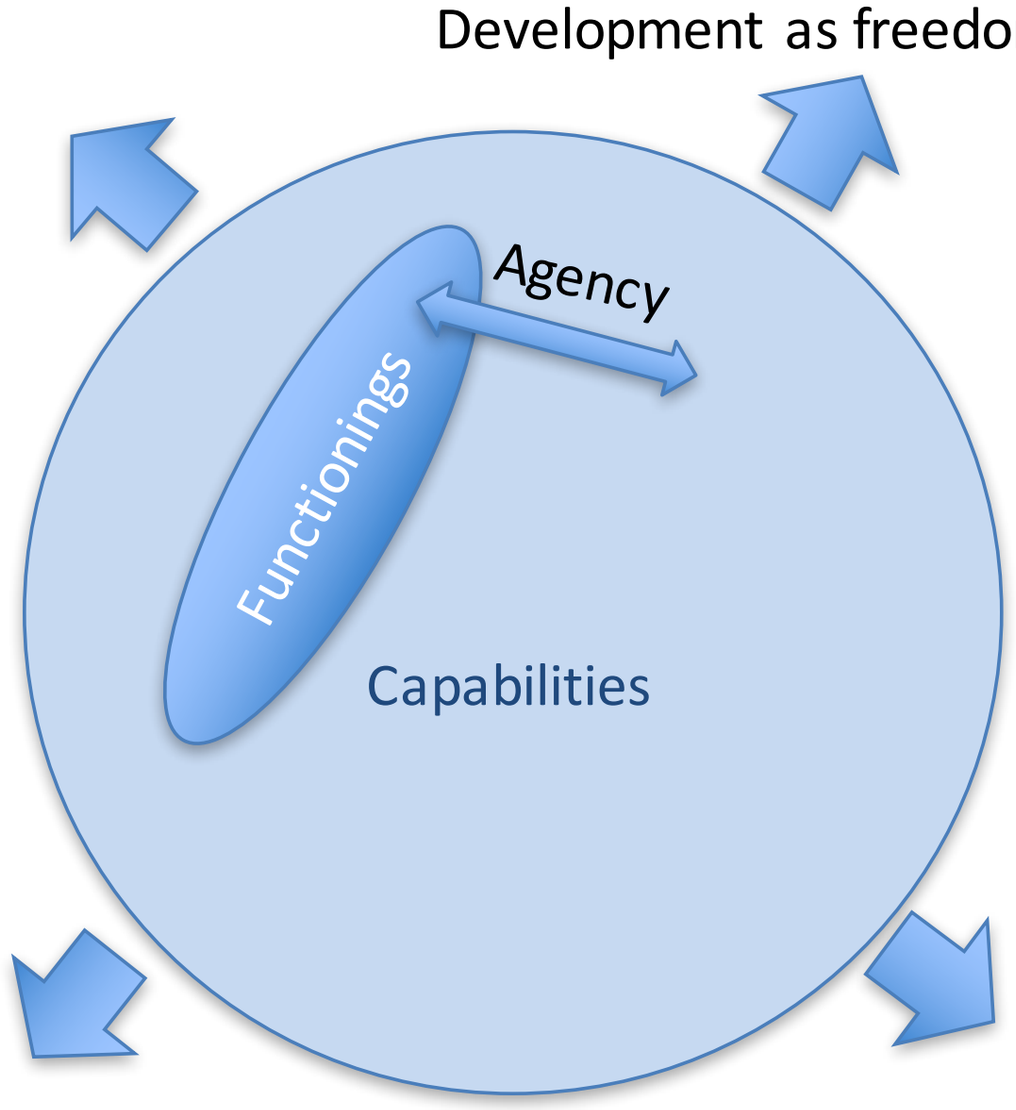
Post-automation contexts

If craft is coming full circle, it's doing so in the context of *post-automation:*

- reappraising human agency in 'automation' technologies
- into non-industrial and new-industrial spaces
- groups are pursuing creative livelihoods and environmental sustainability
- subversions of technologies



Assessing agency (I) capabilities approach: *conversion*

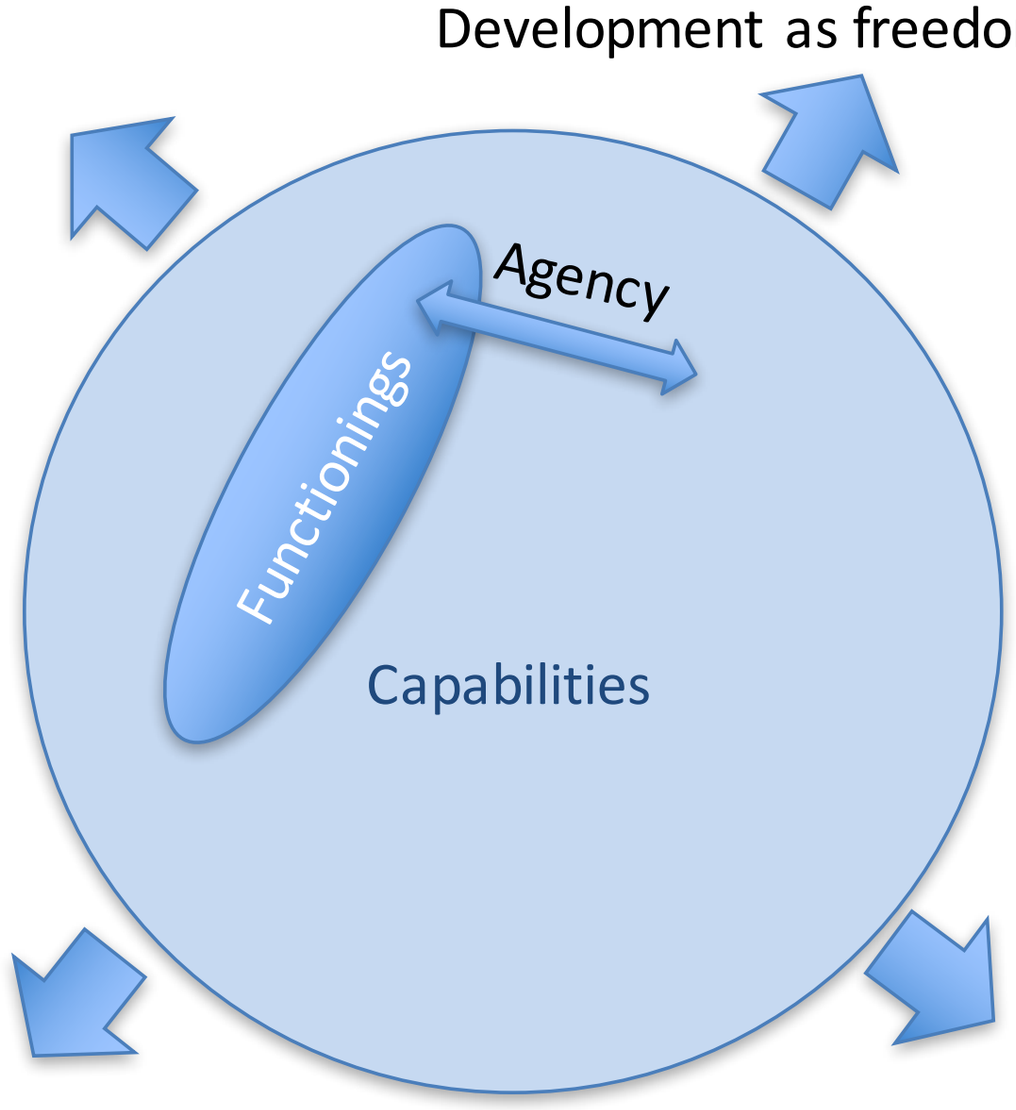


Assessing agency (I) capabilities approach: *conversion*

Assess agency through <u>moment of conversion</u>

commodity => capability

(Sen, Nussbaum, etc.)

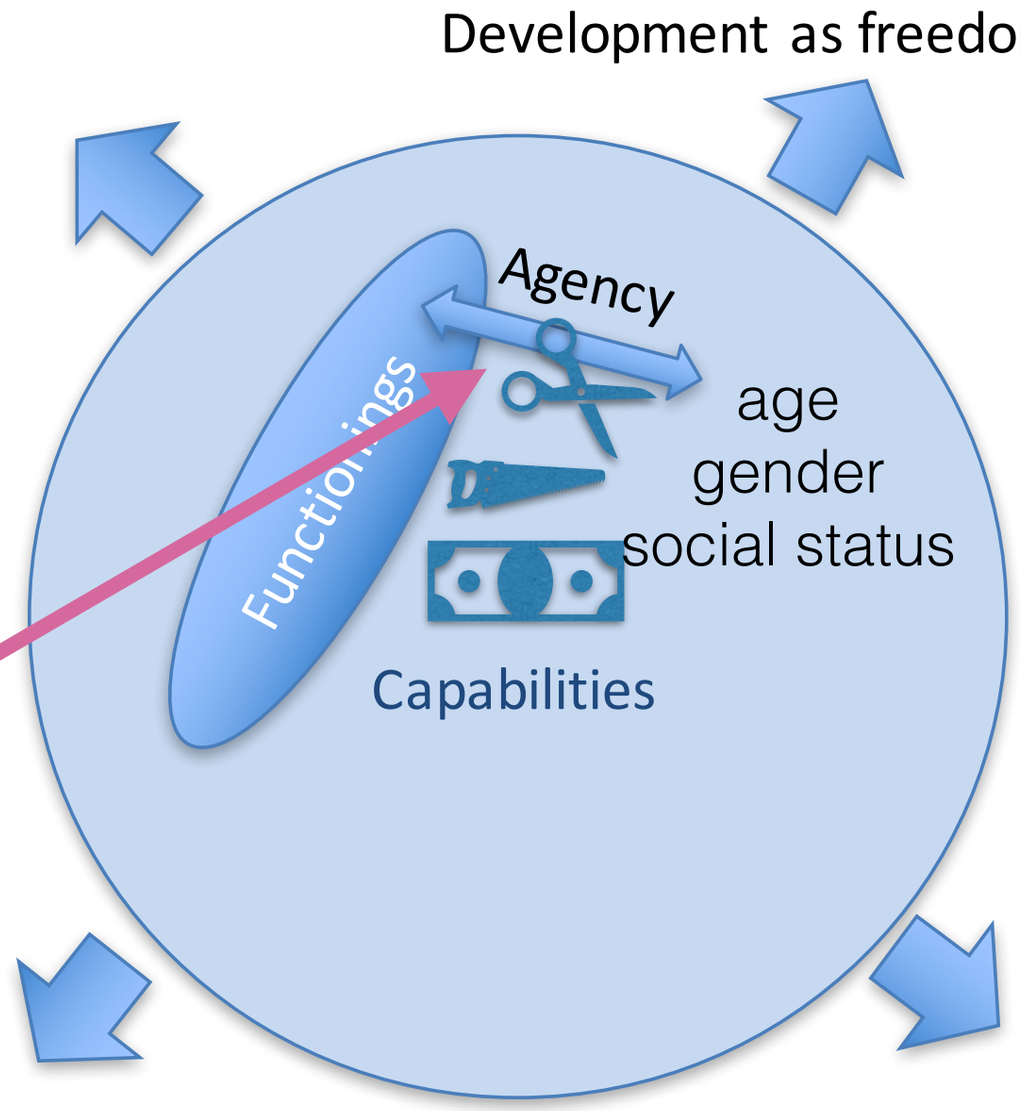


Assessing agency (I) capabilities approach: *conversion*

Assess agency through <u>moment of conversion</u>
commodity => capability

(Sen, Nussbaum, etc.)

<u>Conversion factors</u>
Resources, personal & social factors



Assessing agency (II)
collective and plural *translation*

STS: agency as

- Collective & relational
- Plural

(Serres, Callon, Latour)

=>

<u>Moments of translation</u>

People / tech / environment

(Kullman & Lee, 2012)

Assessing agency (II) collective and plural *translation*

STS: agency as

- Collective & relational
- Plural

(Serres, Callon, Latour)

=>

<u>Moments of translation</u>

People / tech / environment

(Kullman & Lee, 2012)

- How are non-industrial digital fabrication activities opening up automation technologies (or not) to post-automation appropriations?

Assessing agency (II) collective and plural *translation*

STS: agency as

- Collective & relational
- Plural

(Serres, Callon, Latour)

=>

<u>Moments of translation</u>

People / tech / environment

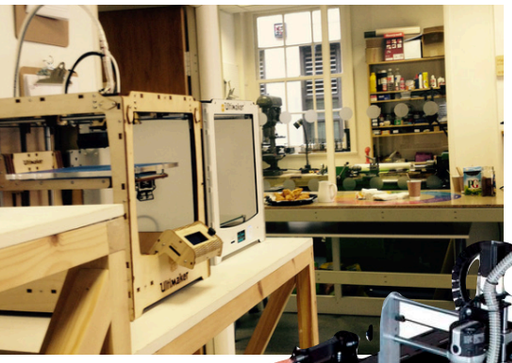
(Kullman & Lee, 2012)

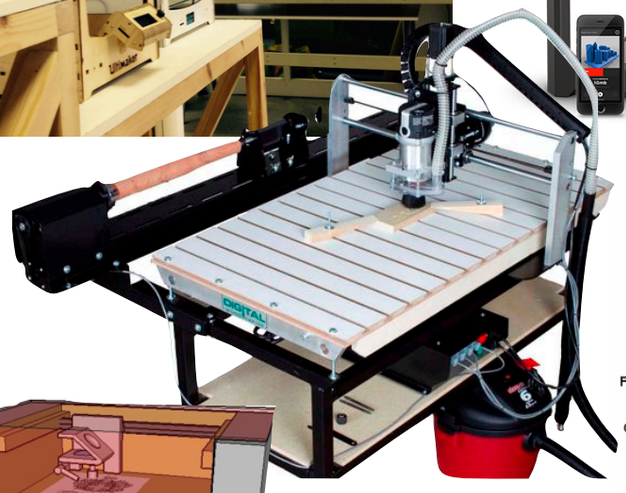
- How are non-industrial digital fabrication activities opening up automation technologies (or not) to post-automation appropriations?

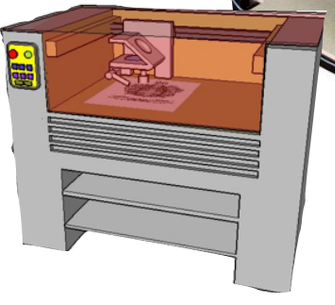
- What evidence is there for sociotechnical relations based in care for other people, for materials, and for the consequences of manufacture, good and bad?

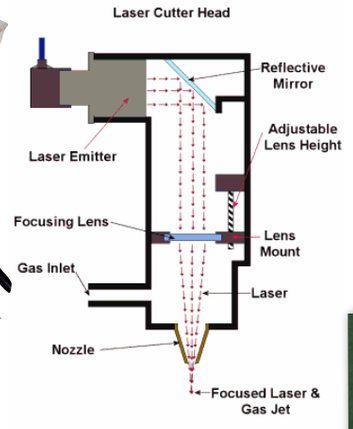
flickr.com/photos/10579705@N08/18685063746

flickr.com/photos/kk/16521663068



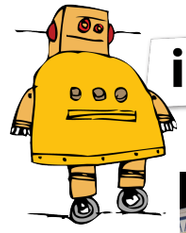






Digital fabrication technologies

Make:



instructables

blender

GitHub

Thingiverse

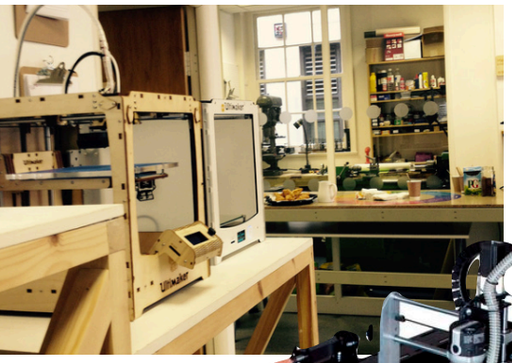
Ponoko
WWW.PONOKO.COM

SketchUp

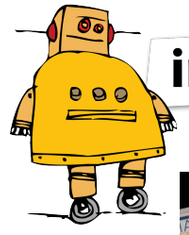
opendesk

flickr.com/photos/10579705@N08/18685063746

flickr.com/photos/kk/16521663068



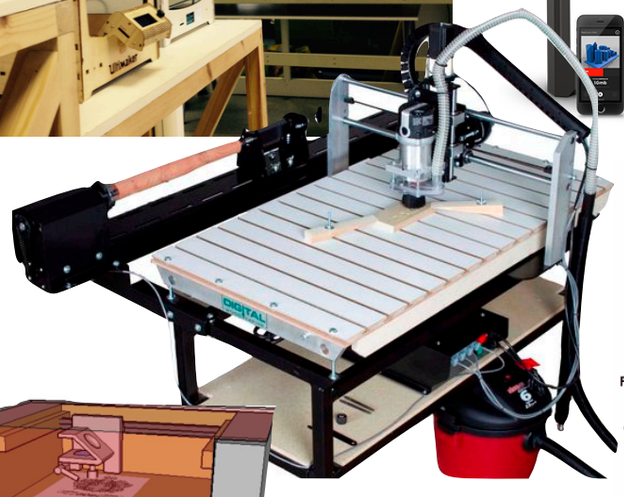
Make:

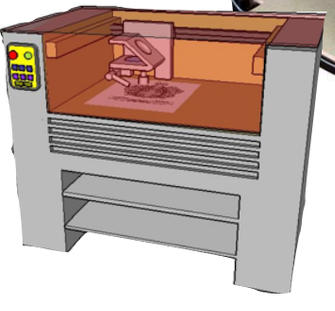


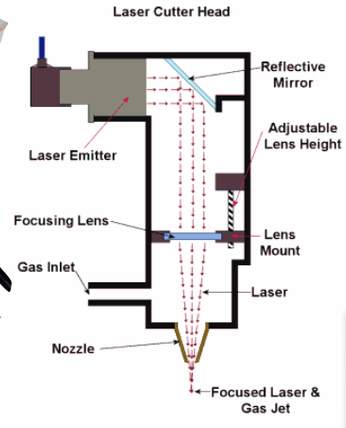
instructables

blender

GitHub







Digital fabrication technologies

Thingiverse

Ponoko
WWW.PONOKO.COM

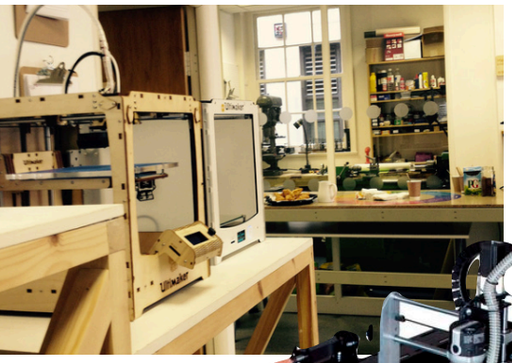
SketchUp

opendesk

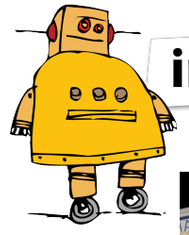
Makers, hackers crafters, coders, users

flickr.com/photos/10579705@N08/18685063746

flickr.com/photos/kk/16521663068

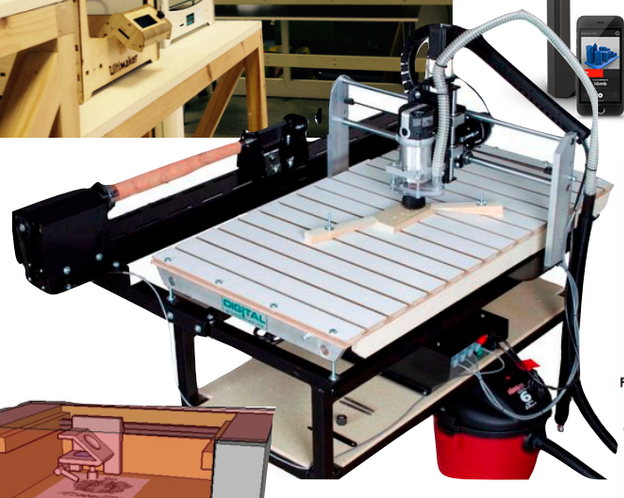


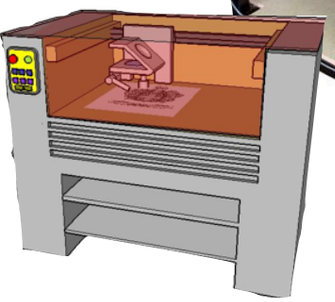
Make:

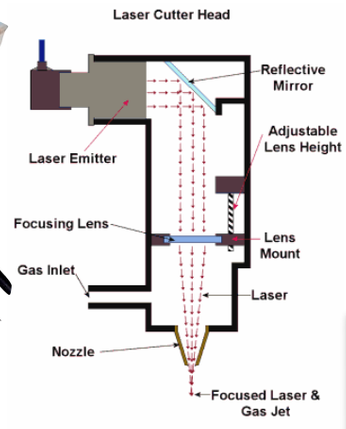


instructables

GitHub







Digital fabrication technologies

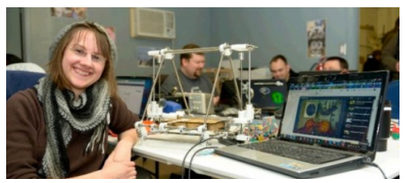
Thingiverse

Ponoko
WWW.PONOKO.COM

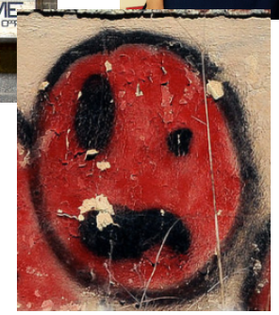
SketchUp

opendesk

Makers, hackers crafters, coders, users



Happiness / well-being



flickr.com/photos/barnoid/15685652867 flickr.com/photos/doctorow/15002474707 flickr.com/photos/oceannmilla/24485784524 flickr.com/photos/42456408@N07/17538255545
flickr.com/photos/chaoticeunoia/9546152138 flickr.com/photos/10579705@N08/18521193978 flickr.com/photos/jgurbisz/14539502279 flickr.com/photos/10579705@N08/18523626428

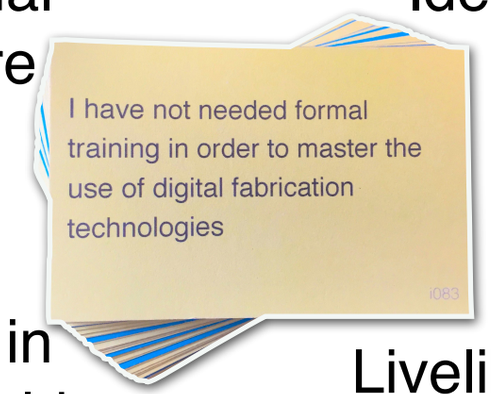
Q-methodology
Crafters and coders

Based on your personal experiences of using digital fabrication technologies: to what extent are the statements on the cards like your point of view?

Skills

Material culture

Identity

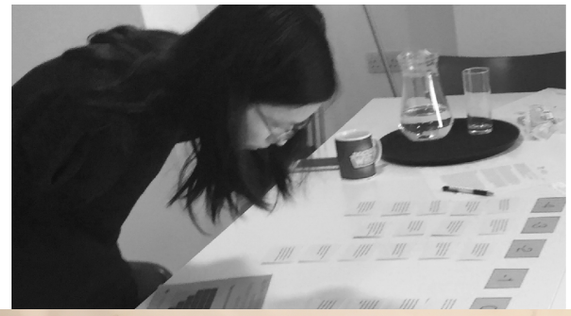


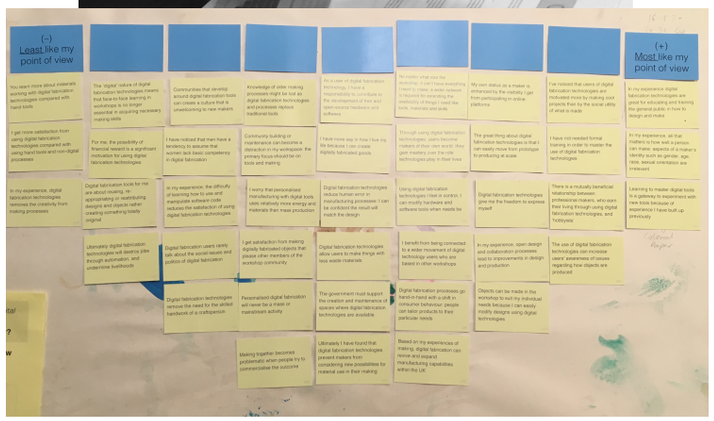
Place in the world

Livelihoods

Community

i=42





n=36

F1

Makers of community
19 makers
Hobbyists + pros
7 crafters
12 coders

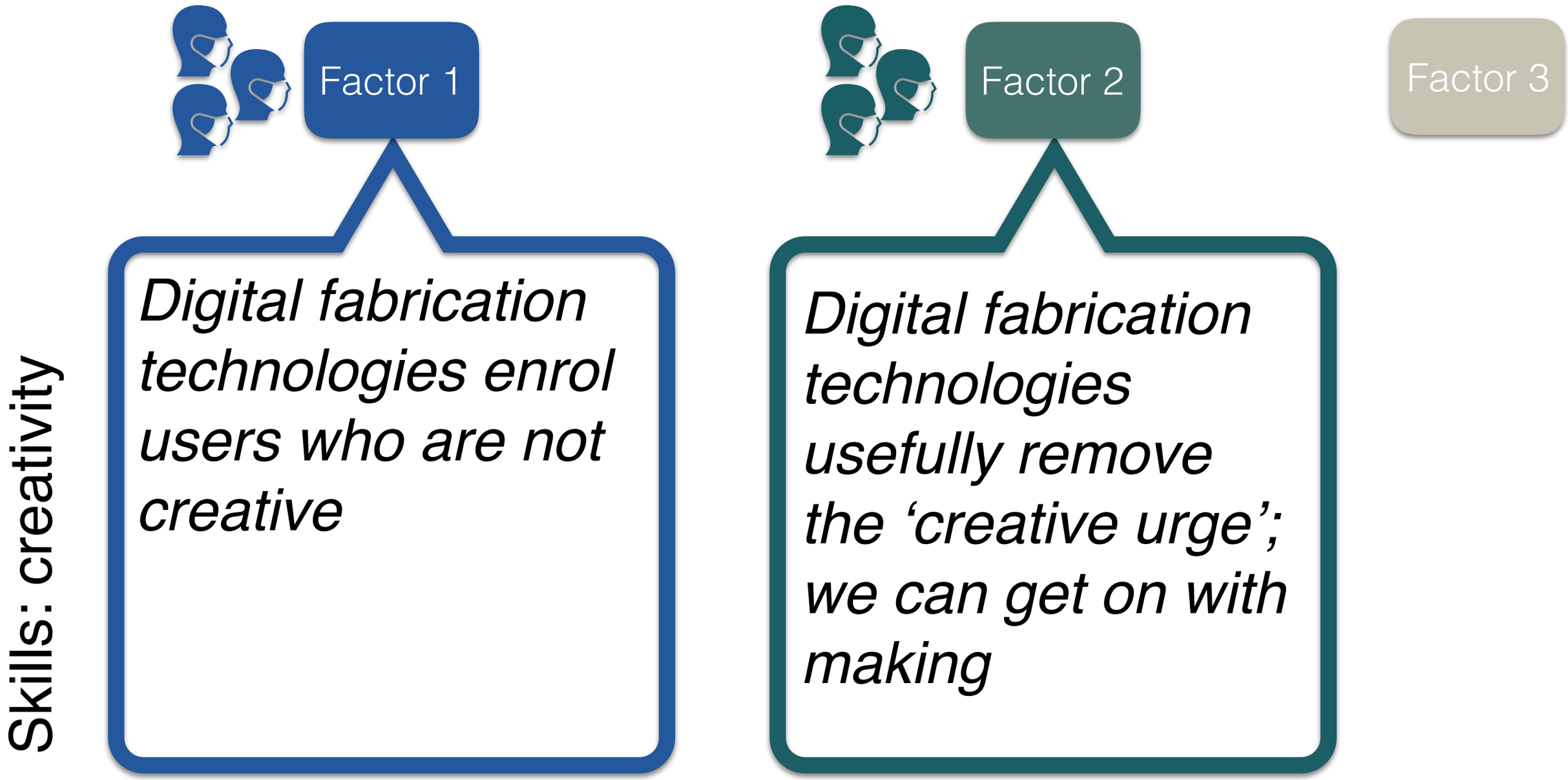
F2

Professional makers
7 makers
pros
5 crafters
1 coder
+1 [artist]

F3?

f=3

RQ1. How digital fabrication technologies are opening-up post-automation appropriations (or not)



RQ1. How digital fabrication technologies are opening-up post-automation appropriations (or not)

Place in the world: Education

Factor 1

Digital technologies are great teaching tools: they enrol members of the public into maker workshop communities

Factor 2

Digital technologies are no better as education tools; they close-down considerations of wider material cultures

Factor 3

Place in the world: social value of making

RQ1. How digital fabrication technologies are opening-up post-automation appropriations (or not)

Factor 1

A sense of social purpose influences making

Factor 2

The social purpose of output is often valued, social purpose of process not so much

Factor 3

RQ1. How digital fabrication technologies are opening-up post-automation appropriations (or not)

Material culture: energy and waste

Factor 1

Don't consider waste use

Factor 2

Designs often mean excess waste materials are guaranteed

Factor 3

RQ2. Evidence for new socio-technical relations

Identity: digital reproduction

Factor 1

Digital fabrication technologies afford quick and easy expression

Factor 2

Digital reproduction & replication a negative, [rejecting Cardosso's idea that craft has come full circle]

Factor 3

Material culture: new material possibilities

RQ2. Evidence for new socio-technical relations

Factor 1

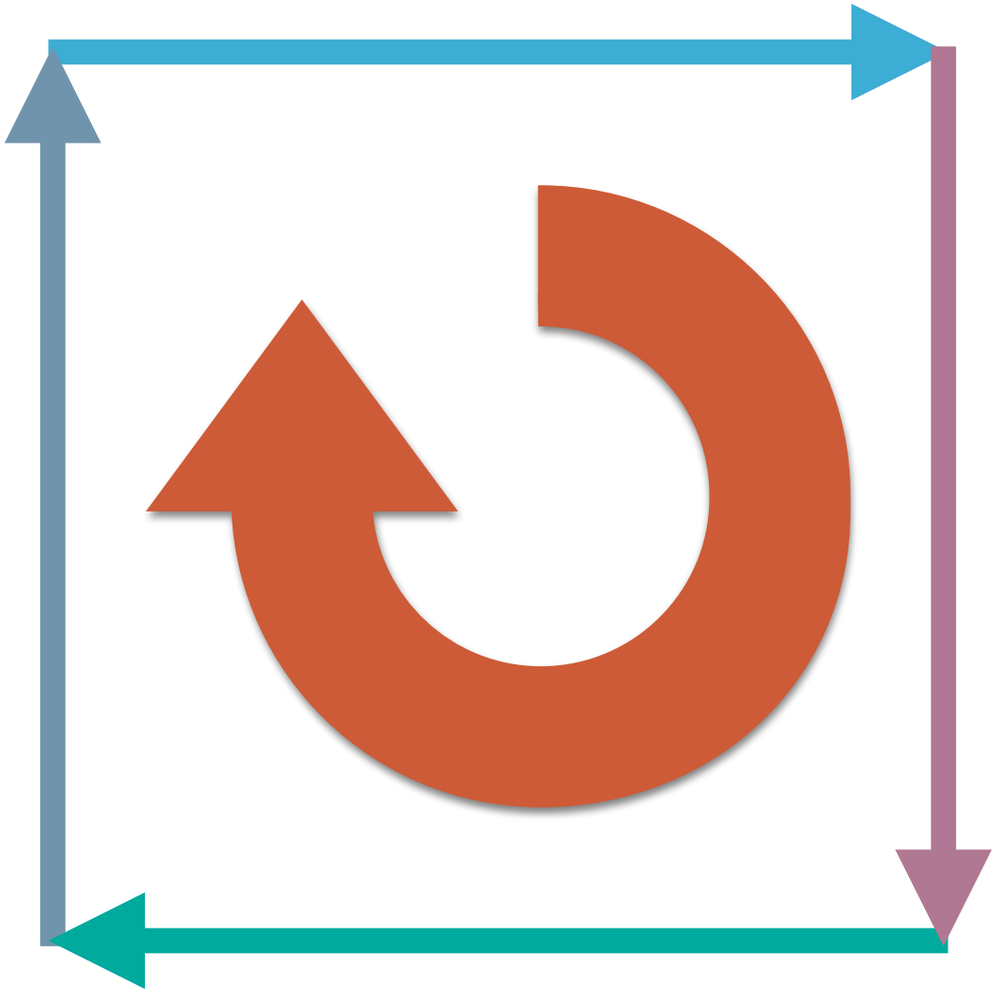
Open up as many material possibilities as they foreclose

Factor 2

Prevent users from considering new material possibilities

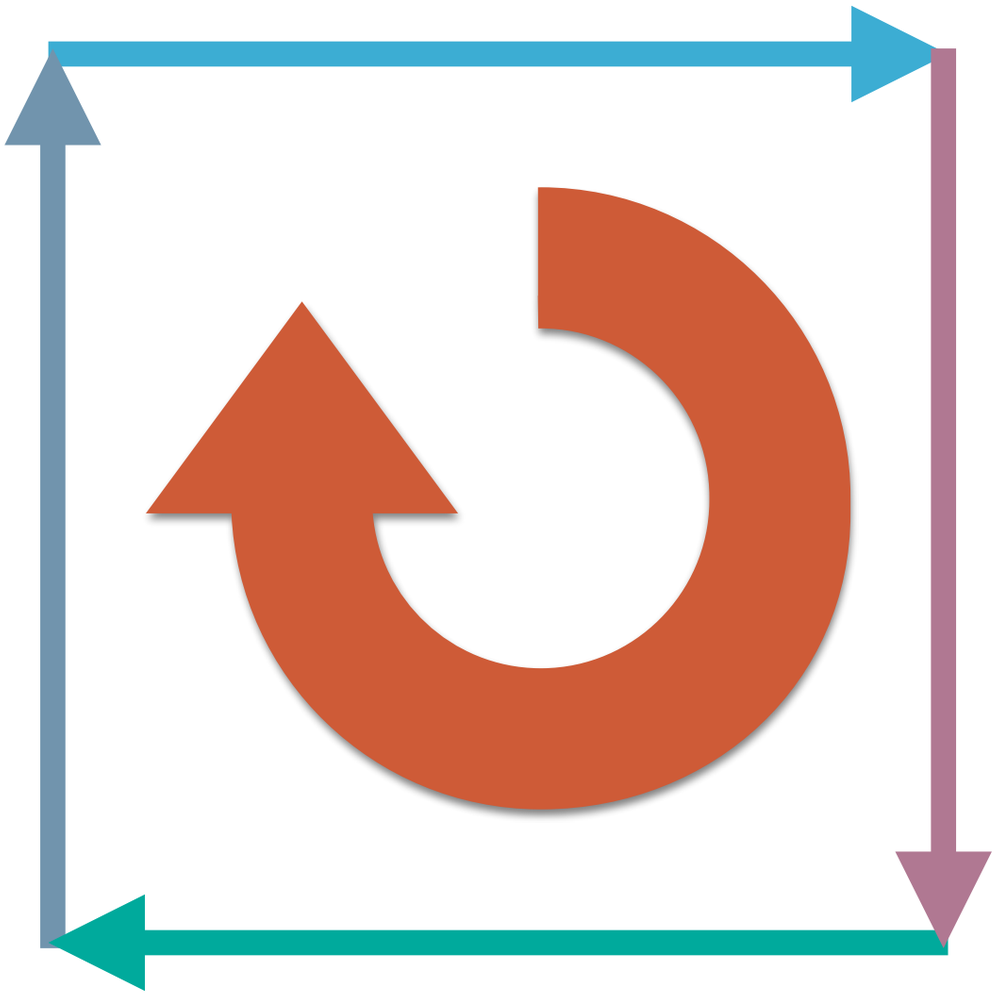
Factor 3

Comments and conclusions



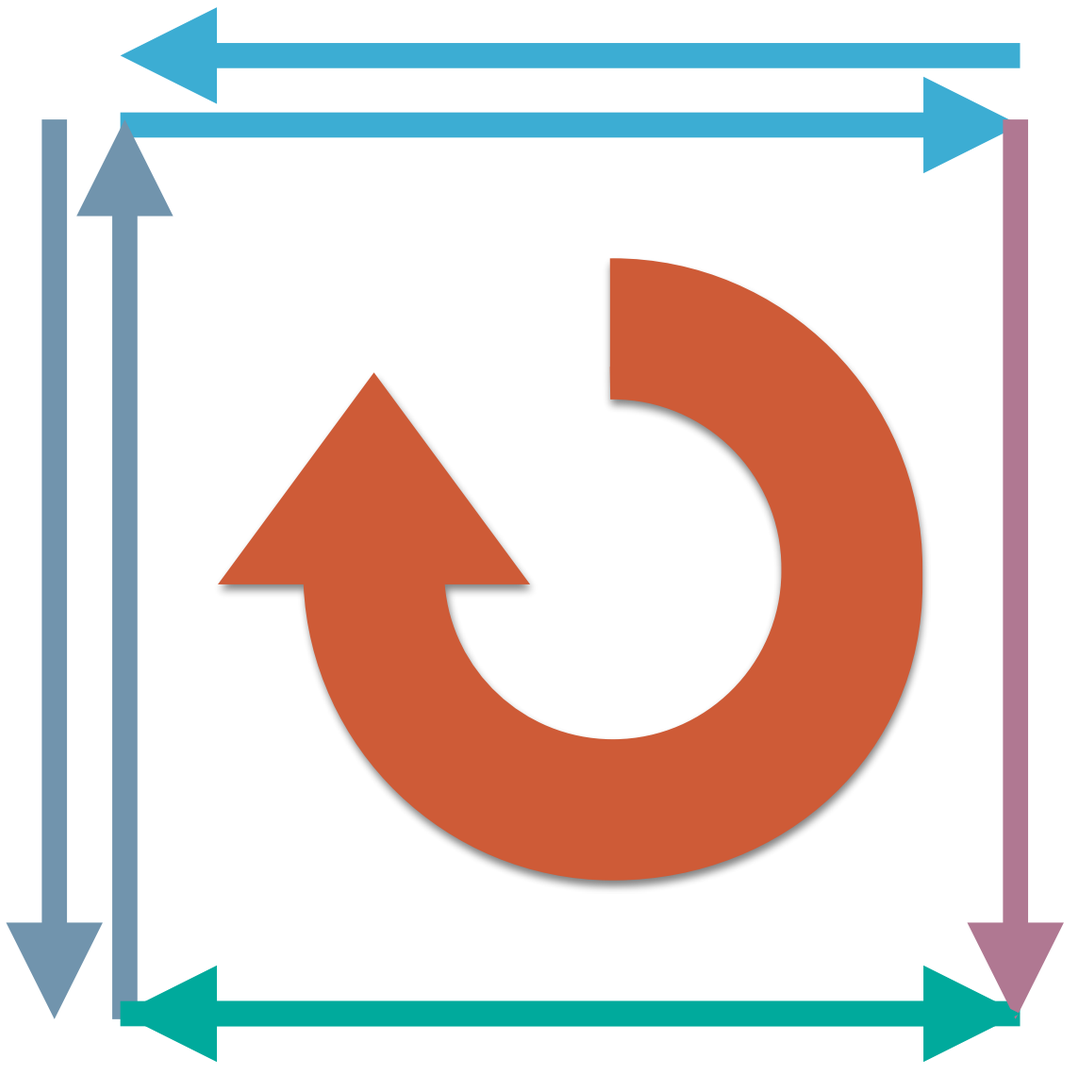
Comments and conclusions

Post-automation empirics:
Conversion & *translation*
contingent and plural;
Cardoso's 'full-circle'?!?



Comments and conclusions

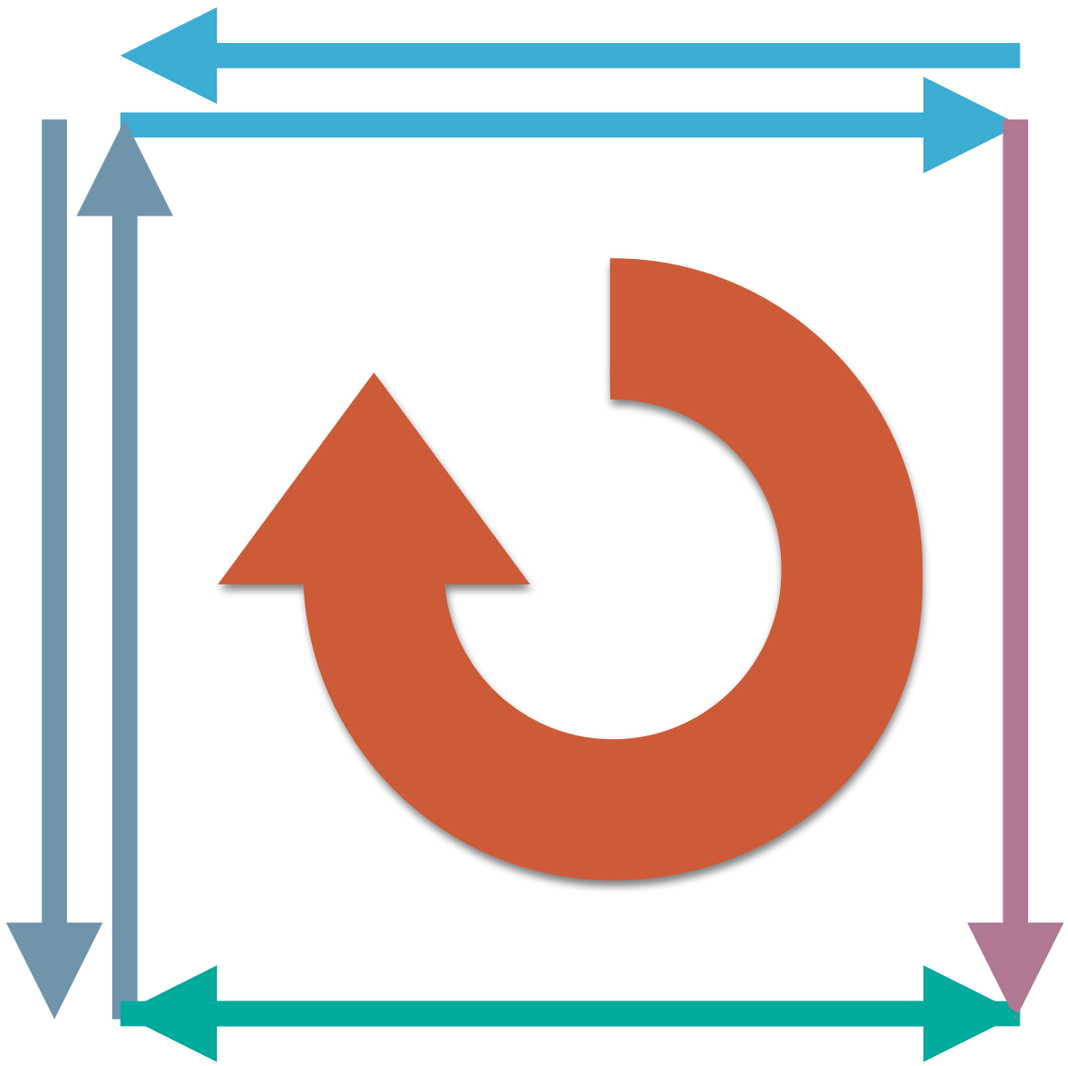
Post-automation empirics:
Conversion & *translation*
contingent and plural;
Cardoso's 'full-circle'?!?



Comments and conclusions

Post-automation empirics:
Conversion & *translation*
contingent and plural;
Cardoso's 'full-circle'?!?

Design as control vs care for others, material cultures: not given

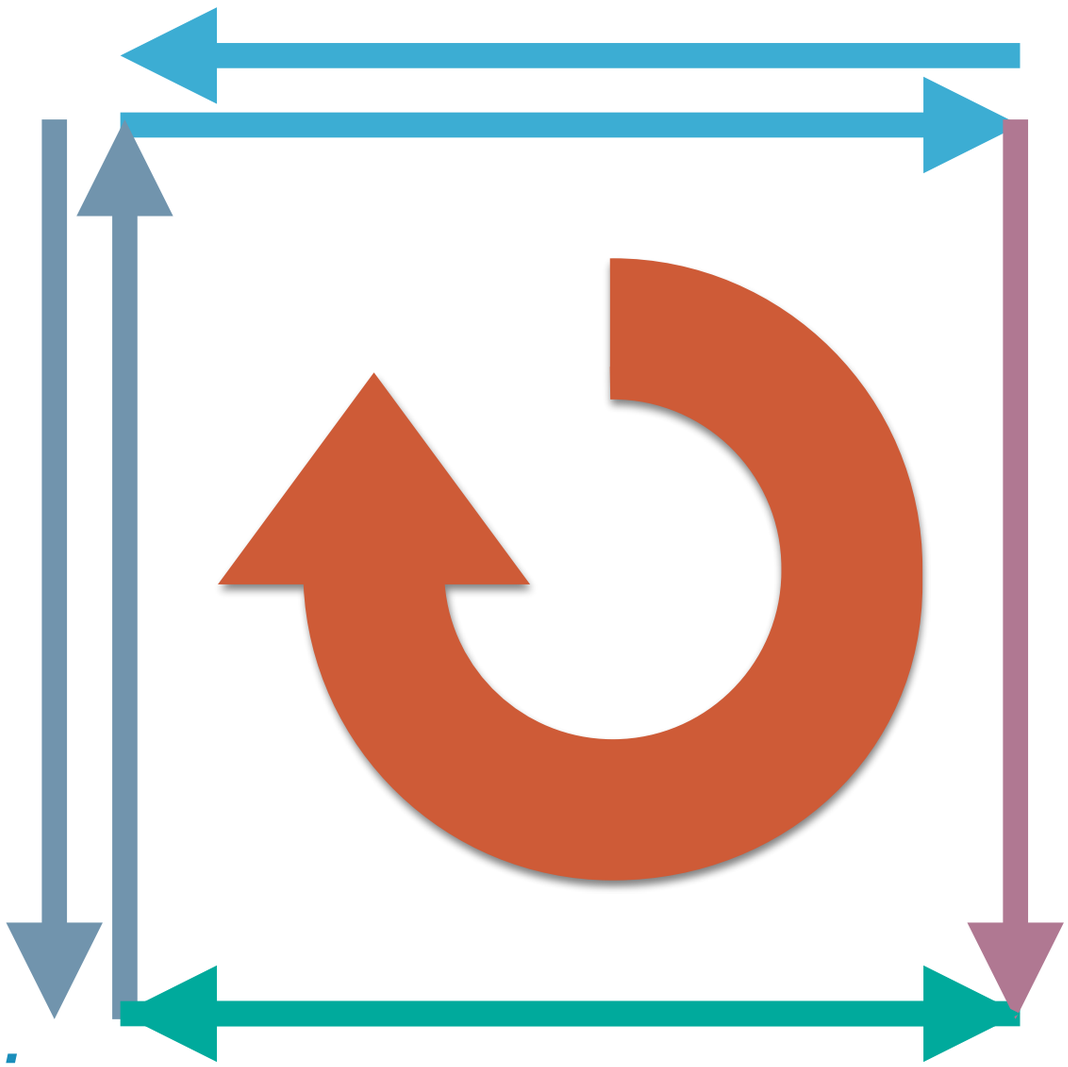


Comments and conclusions

Post-automation empirics: *Conversion* & *translation* contingent and plural; Cardoso's 'full-circle'?!?

Design as control vs care for others, material cultures: not given

Post-automation theory: considerations of *freedom-within*, not only *freedom-from;* –automation is not automatic



Thanks
Digital fabrication and wellbeing: human agency in post-automation

An analysis into the appropriation of digital design and fabrication technologies by crafters and coders in non-industrial settings

Cian O'Donovan *@cian* Adrian Smith *@smithadrianpaul* Ed Steinmueller
4S, Boston, August 2017

Project Responsible innovation and happiness: A new approach to the effects of ICTs
Funder The Research Council of Norway **Coordination** TIK Centre, University of Oslo